

PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional) QIM 2003 P 51718 US	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on _____ Signature _____ Typed or printed name _____		Application Number 10/766,053 First Named Inventor Haupt Art Unit 2892	Filed January 28, 2004 Examiner Tran, Thanh Y.
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p> <p>I am the</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> applicant/inventor. <input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96) <input checked="" type="checkbox"/> attorney or agent of record. Registration number <u>37,793</u> <input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____ </div> <div style="width: 45%;"> _____ Signature <u>Brian A. Carlson</u> Typed or printed name <u>972-732-1001</u> Telephone number <u>January 22, 2010</u> Date </div> </div> <p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below".</p>			
<input checked="" type="checkbox"/> *Total of <u>1</u> form is submitted.			

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Haupt	Docket No.:	QIM 2003 P 51718 US
Serial No.:	10/766,053	Art Unit:	2892
Filed:	January 28, 2004	Examiner:	Tran, Thanh Y.
For:	Method for N ⁺ Doping of Amorphous Silicon and Polysilicon Electrodes in Deep Trenches		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Dear Sirs:

Claims 1-27 and 29 all have been rejected under grounds that are clearly in error and, as a result, this case is appropriate for the pre-appeal brief review procedure.

Applicant currently has three pending independent claims, 1, 18 and 29. The final Office Action dated October 27, 2009 rejected independent claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Lee, U.S. Patent No. 6,759,335 ("Lee") in view of Stamp et al., U.S. Patent Publication No. 2004/0084149 ("Stamp"). The final Office Action rejected independent claim 18 under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Stamp and Chung et al., U.S. Patent No. 6,734,106 ("Chung"). Lastly, the final Office Action rejected claim 29 under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Mo, U.S. Patent Publication No. 2002/0024091 ("Mo"). Applicant respectfully traverses these rejections.

1. Incorporating Stamp or Mo Into Lee Would Render Lee's Embodiment Unsatisfactory for Its Intended Purpose

Applicant respectfully asserts that Lee and Stamp (re claims 1 and 18) and Lee and Mo (re claim 29) cannot be combined in the manner proposed by the Office Action. "If [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." M.P.E.P. § 2143.01(V) (citing *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984)).

In particular, it is not clear how Stamp's silicon-containing film 410 of Fig. 4A can be functionally incorporated as Lee's buried strap 62 of Figs. 6-7 as proposed by the Office Action. Stamp discloses that silicon-containing film 410 exhibits good step coverage, which Stamp describes as uniform film thickness across different step heights of the conformal silicon-containing film. *See, e.g.*, Stamp, ¶ [0061], Fig. 4.

Likewise, it is not clear how Mo's conformal polysilicon layer 614 of Fig. 6B can be functionally incorporated as Lee's buried strap 62 of Figs. 6-7 as proposed by the Office Action. Similar to Stamp, Mo shows that polysilicon layer 614 is conformal and uniform, providing good step coverage across the substrate. *See, e.g.*, Mo, Figs. 6B-6C.

In contrast to Stamp and Mo, Lee discloses depositing polysilicon buried strap 62 using a selective deposition method such as a hemispherical grain (HSG) process. *See, e.g.*, Lee, Fig. 6, col. 3:61-col. 4:7. As taught by Lee, the "selective hemispherical grain (HSG) polysilicon deposition scheme is used to deposit a controlled thickness of polysilicon over an amorphous silicon layer. The process of the present invention controls buried strap thickness and doping level." *Id.* at col. 2:50-54. Unlike the conformal step coverage taught by Stamp and Mo, Lee teaches selectively forming buried strap 62 essentially only on amorphous silicon 54. *See id.* at

col. 3:61-col. 4:7, Fig. 6. Substituting the uniform, conformal silicon-containing film 410 of Stamp or the uniform, conformal polysilicon layer 614 of Mo for Lee's buried strap 62 would form a silicon layer non-selectively deposited on essentially all exposed surfaces, not just on amorphous silicon 54. Because this would render the device of Lee unsatisfactory for its intended purpose, Applicant asserts that there is no motivation for one of ordinary skill in the art to make the proposed combinations.

2. Lee Teaches Away From Being Combined With Stamp or Mo

A "prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." M.P.E.P. § 2141.02(VI) (citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)) (emphasis in original). The final Office Action states that it would have been obvious to modify Lee with Stamp or Mo to provide good step coverage over the trench in the semiconductor substrate. See Final Office Action, pp. 3 & 12 (both citing Stamp, ¶ [0061]). Lee, however, discloses selective deposition and teaches away from "good step coverage." For example, Lee states that the "selective HSG polysilicon deposition method deposits the buried strap polysilicon to a controlled thickness. This process avoids planarization of the buried strap layer by CMP which adds process complexity." Lee, col. 4:20-24. Substituting in either Stamp's conformal silicon-containing layer or Mo's conformal polysilicon layer, if workable at all, would require the very planarization that Lee is seeking to avoid with the selective deposition process. Thus, Lee teaches away from using a conformal step coverage process, such as that of Stamp or Mo, because it would add process complexity. Therefore Applicant asserts that there is no motivation for one of ordinary skill in the art to make the proposed combinations.

3. Stamp's Silicon-Containing Layer 410 Does NOT Provide the Same Function As That Of Lee's Polysilicon Buried Strap 62

The Advisory Action dated January 13, 2010 states that

silicon layer 410 of fig. 4A in Stamp's reference has the same material as the silicon layer material in Lee and the present invention, further fig. 4A of Stamp clearly discloses the same modified structure, and thus silicon-containing layer 410 of Stamp will provide the same function as that of the silicon layer in Lee's reference while incorporating with buried strap 62 in figs. 6-7 [of Lee].

Advisory Action, p. 2. Applicant traverses. Lee's polysilicon buried strap 62 is deposited using a selective hemispherical grain (HSG) method that deposits the polysilicon only on amorphous silicon layer 54. *See, e.g., Lee, Figs. 6-7, col. 3:58-col. 4:7.* This selective HSG polysilicon deposition method functions to achieve a controlled thickness and avoid planarization of the buried strap 62 by CMP, thereby simplifying the process. *See, e.g., id.* at col. 4:20-24. In contrast, the conformal silicon-containing film 410 of Stamp functions to provide good step coverage across different step heights. *See, e.g., Stamp, ¶ [0061], Fig. 4.* As discussed in detail above, Lee's selectively-deposited layer and Stamp's conformally-deposited layer are used for very different, and essentially opposite, functions (*i.e.*, selective deposition versus conformal step coverage). Therefore, Applicant strenuously disagrees with this assertion in the Advisory Action.

4. Conclusion

Accordingly, Applicant respectfully submits that neither Stamp nor Mo can be combined with Lee, and therefore submits independent claims 1, 18 and 29 (and dependent claims 2-17 and 19-27) are patentable over the cited prior art.

In view of the above, Applicant respectfully requests that the final rejection be withdrawn and the application passed to issuance.

Respectfully submitted,

January 22, 2010

Date

/Brian A. Carlson/

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